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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,760	08/21/2003	Masakazu Dohi	Q76208	7295
23373	7590	11/02/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			KRAMSKAYA, MARINA	
			ART UNIT	PAPER NUMBER
			2858	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/644,760

Applicant(s)

DOHI ET AL.

Examiner

Marina Kramskaya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/21/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/21/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Drawings

2. Figures 3 & 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 1 is objected to because of the following informalities: The claim language is not in the appropriate independent claim format of Preamble followed by Transition Phrase further followed by the Body of the claim. Appropriate correction is required.

The following changes are suggested: Insertion of the term "comprising" in line 1 after "combustion engine."

4. Claim 1 is objected to because of the following informalities: The phrase "capable of" renders the claim indefinite because the limitations of the claimed invention are unclear.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al., US 5,895,839, in view of Bohman et al., US 4,042,132.

Takahashi discloses an ionic current detection apparatus (FIG. 7) for an internal combustion engine for detecting an ionic current generated in spark plugs (4A-D)

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connected with secondary sides (2bA-D) of a plurality of ignition coils (2A-D), respectively, each of which generates a high ignition voltage immediately after firing of an air fuel mixture in a corresponding combustion chamber of the internal combustion engine (column 1, lines 20-26).

Takahashi does not disclose the arrangement of the said plurality of ignition coils whereby at least the directions of adjacent ignition coils do not coincide with one another.

Bohman discloses an arrangement of coils in a direction where adjacent electrodes do not coincide, ie. the axes of adjacent coils are perpendicular (column 1, lines 48-51).

Therefore, it would be obvious to a person of ordinary skill in the art, to arrange the ignition coils in a non-coinciding direction as taught by Bohman, in the spark plug-coil arrangement of Takahashi, in order to minimize coupling between adjacent coils (column 1, lines 50-51).

As per Claim 2, Takahashi and Bohman disclose the ionic current detection apparatus for an internal combustion engine as set applied to Claim 1 above.

Bohman further discloses an arrangement of coils, wherein said plurality of ignition coils are arranged in such a manner that the directions of the central axes of ignition coils among adjacent ignition coils do not coincide with one another, ie. the axes of adjacent coils are perpendicular (column 1, lines 48-51).

Therefore, it would be obvious to a person of ordinary skill in the art, to arrange the ignition coils in a non-coinciding direction as taught by Bohman, in the spark plug-coil arrangement of Takahashi, in order to minimize coupling between adjacent coils (column 1, lines 50-51).

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of Bohman, further in view of Shimizu et al., US 6,348,797.

Takahashi and Bohman disclose the ionic current detection apparatus for an internal combustion engine as set applied to Claim 1 above.

Takahashi and Bohman do not disclose a fixture for fixing the plurality of ignition coils and installing the ignition coils on the engine through the fixture.

Shimizu discloses the fixture and the installation process through the fixture for the said ignition coils in Figures 4A and 4B.

Therefore, it would be obvious to a person of ordinary skill in the art, to fix the ignition coils, as disclosed by Takahashi and Bohman, in a fixture and mount the ignition coils on to the engine through the said fixture, as taught by Shimizu, in order to stabilize the coils in the desired position.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents disclose ionic current detectors with ignition coils having a primary and secondary windings connected to a spark plug, and a plurality of the said detectors for each cylinder in an internal combustion engine: Sakakura, US 2003/0116148 A1; Katogi et al., US 6,343,500 B1; Takahashi et al., US 6,202,474 B1; Aoki et al., US 6,151,954; Kawamoto et al., US 5,548,220; Miyata et al., US 5,347,856.

Daniels et al., US 2004/085070 A1, discloses an ionic current detector and a method of fixing and installing the ignition coils.

Dowsett et al., US 3,617,866, discloses an arrangement of coils in a manner where the central axes of the adjacent coils are perpendicular to one another.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571)272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MK

Marina Kramskaya
Examiner
Art Unit 2858

M. Kramskaya



N. Le
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